

Saint Paul, Minn.: the steamer "Mary Morton," from Saint Louis, Mo., arrived here and departed on the 26th. She is reported to be the last boat of the season.

In the following table are shown the danger-points at the various stations; the highest and lowest depths for October, 1888, with the dates of occurrence and the monthly ranges:

*Heights of rivers above low-water mark, October, 1888 (in feet and tenths).*

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, La. ....	29.9	1	6.3	31	1.0	5.3
<i>Arkansas River:</i>						
Fort Smith, Ark. ...	22.0	1	1.7	19-21 and 25-27	1.1	0.6
Little Rock, Ark. ...	23.0	1	2.4	19, 23	1.4	1.0
<i>Missouri River:</i>						
Leavenworth, Kans. ...	20.0	1	6.6	31	5.5	1.1
Kansas City, Mo. ...	21.0	1	6.6	31	6.0	0.6
<i>Mississippi River:</i>						
Saint Paul, Minn. ...	14.5	30, 31	3.6	1	2.9	0.7
La Crosse, Wis. ....	24.0	30, 31	3.8	11	3.3	0.5
Dubuque, Iowa. ....	16.0	1, 2	3.4	14, 15	2.9	0.5
Des Moines, Iowa. ....	15.0	22	2.2	8, 14	1.8	0.4
Keokuk, Iowa. ....	14.0	1, 23, 24	1.8	13, 18	1.2	0.6
Saint Louis, Mo. ....	32.0	1	6.0	18	5.0	1.0
Cairo, Ill. ....	40.0	31	18.6	13, 16	5.0	13.6
Memphis, Tenn. ....	34.0	31	12.2	18, 19	4.8	7.4
Vicksburg, Miss. ....	41.0	1	13.7	25	2.4	11.3
New Orleans, La. ...	13.0	1	4.5	17-22 and 28-31	3.3	1.2
<i>Ohio River:</i>						
Pittsburgh, Pa. ....	22.0	21	11.3	1	4.4	6.9
Parkersburg, W. Va. ...	38.0	20	16.0	1	3.7	12.3
Cincinnati, Ohio. ....	50.0	30	33.0	5	6.9	26.1
Louisville, Ky. ....	25.0	31	11.8	10	4.3	7.5
<i>Cumberland River:</i>						
Nashville, Tenn. ....	40.0	31	16.0	13	1.4	14.6
<i>Tennessee River:</i>						
Chattanooga, Tenn. ...	33.0	28	20.0	8	2.8	17.2
<i>Monongahela River:</i>						
Pittsburgh, Pa. ....	29.0	21	11.3	1	4.4	6.9
<i>Savannah River:</i>						
Augusta, Ga. ....	32.0	27	20.9	23	7.9	13.0
<i>Willamette River:</i>						
Portland, Oregon. ...	15.0	6	3.4	1	0.9	2.5

\* For 25 days.

#### FLOODS.

Saint Paul, Minn., 5th: reports from Ramsey Co., Dak., state that the recent freshets have destroyed nearly all of the wheat crop in that county, and that, as a consequence, the inhabitants are in a destitute condition.

Bangor, Me., 8th: heavy rains since the 5th instant have caused freshets in this section. Oldtown, Penobscott Co., Me., 8th: heavy rains have caused the Kennebec River to rise, doing much damage to property and the lumber interests.

Calais, Washington Co., Me., 9th: the Saint Croix and Aroostook rivers are nearly at their high water marks; lumber mills and factories are being closed; timber is being carried away by the floods; railroads washed out, and crops damaged or ruined. Fairfield, Somerset Co., Me., 9th; great freshets prevail in this vicinity, causing much damage to mill property.

Saint John's, N. B., 10th: trains on the New Brunswick Railroad were delayed on the 8th by washouts resulting from the recent heavy rains. Reports from Fredericton state that four bridges crossing the Nashwaak River were swept away yesterday, together with 1,000,000 feet of logs. The water has caused great destruction to the hay and buckwheat crops in Queens and Carleton counties; barns were swept away and a number of saw mills flooded.

Los Angeles, Cal.: the following are extracts from the Los Angeles "Daily Herald" of October 19th and 20th, 1888: "A cloud burst of extraordinary violence is reported on the desert along the line of the Southern Pacific Railroad. The rain came down in a perfect torrent on the night of the 18th, causing big washouts between Gila Bend and Texas Hill, Ariz., and numerous, though not very large washouts, between Cactus and Salton, Cal. The water fell in almost a solid mass at times, over two inches being registered at one place inside of an hour."

#### HIGH TIDES.

Eastport, Me., 7th to 9th. Cedar Keys, Fla., 10th: on this date a storm of marked energy was central over the eastern part of the Gulf of Mexico. At 9.30 p. m. the wind veered from easterly to south, and the barometer stood at 29.22 (lowest during storm). At this hour the water was at low water mark, and by 10 p. m. had risen over nine feet, covering the streets in the lower part of the town, and floating off three large rafts of logs. Many people fled from their homes and were obliged to wade waist deep in water. No lives were lost, although a number of narrow escapes were reported. Total damage in the vicinity estimated at \$5,000.

### ATMOSPHERIC ELECTRICITY.

#### AURORAS.

Auroral displays were most frequently noted at stations in eastern Massachusetts, where they were observed on nine dates. They were observed south of the fortieth parallel on three dates, i. e., in the Ohio Valley on the 1st and 30th, and in northwestern Kansas on the 31st. The most noteworthy display, which was observed from eastern New England to the upper Missouri valley and southward to the thirty-eighth parallel, occurred on the nights of the 30th and 31st. The passage of a storm-centre from Manitoba over the upper lake region during these dates occasioned more or less cloudiness over the northern part of the country, which doubtless prevented the display from being more generally observed.

At Saint Vincent, Minn., the northern sky was obscured until 11.30 p. m. of the 30th, when an aurora became visible, first as a faint, broad arch, which increased in brilliancy until 1.20 a. m. of the 31st. At this time its altitude was about 15° and azimuth 105°. The display continued until morning, and appeared as a faint auroral light at 8 p. m., 31st. At 9 p. m. the sky became obscured.

Huron, Dak.: an aurora was observed in the north from 10.30 p. m., 30th, until daybreak the following morning; the display, though faint, was very bright at times.

Grand Haven, Mich.: a faint aurora began 10.30 p. m., 30th, which extended from 135° to 260° of azimuth, and rose to a uniform altitude of 15°. Its light was nearly white and quite steady. There were no waves or flashes of light. It increased

in brilliancy until 10.50 p. m., when it was almost obscured by a bank of cumulo-stratus clouds until 11.20 p. m., after which it gradually faded until it disappeared at 11.45 p. m.

Fort Buford, Dak.: an aurora was observed on the 11th; it was first observed at 11.55 p. m., and then consisted of streamers rising apparently from a dark base to an extreme height of about 60°. Owing to clouds in the northern sky the aurora could not be well observed. At 12.58 a. m., 12th, the sky began to clear and the aurora was then in the form of a well-defined arch, with a maximum altitude of about 30°, and of straw and white color. It extended from northwest to northeast, and rested on a well-defined dark base. It disappeared 2.10 a. m., 12th.

Auroras were observed during the month as follows: 1st, Olney, Ill.; Saint Vincent, Minn. 4th, Milton, Mass.; Saint Vincent, Minn. 10th, Gardiner and Orono, Me.; Newburyport, Mass.; Fort Assinaboine, Mont.; Plymouth, N. H. 11th, Huron, Dak.; East Berkshire, Gardiner, Mayfield, and Orono, Me.; Cambridge and Newburyport, Mass.; Nashua, N. H.; Lyons, N. Y. 15-16th, Milton, Mass. 19th, Pekin, Ill.; Milton, Mass. 21st, Saint Vincent, Minn.; South Canisteo, N. Y. 25-26th, Milton, Mass. 29th, Delavan, Wis. 30th, Huron, Kimball, and Webster, Dak.; Belvidere, Cedarville, Lake Forest, Oneida, Oswego, Riley, and Winnebago, Ill.; Butlerville, Ind.; Maquoketa and Osage, Iowa; Kent's Hill and Orono, Me.; Blue Hill Observatory, Cambridge, Fitchburg, Groton, Leicester, Milton, Newburyport, and Provincetown.

Mass.; Grand Haven, Lansing, Noble, and Pontiac, Mich.; Saint Vincent, Minn.; Hanover, N. H.; Beverly, Madison, Moorestown, and South Orange, N. J.; Garrettsville and Wauseon, Ohio; Chelsea, Vt. 31st, Webster, Dak.; Hampton, Iowa; Allison, Kans.; Mayfield, Me.; Traverse City, Mich.; Moorhead, Minn.; Hanover, N. H.

#### THUNDER-STORMS.

Thunder-storms were reported during the month, by states and territories, as follows: 1st, 18; 2d, 13; 3d, 1; 4th, 8; 5th, 8; 6th, 12; 7th, 5; 8th, 2; 9th, 7; 10th, 6; 11th, 4; 12th, 2; 14th, 7; 15th, 7; 16th, 12; 17th, 10; 18th, 14; 19th, 15; 20th, 6; 21st, 5; 22d, 3; 23d, 2; 24th, 1; 25th, 3; 26th, 10; 27th, 11; 28th, 2; 30th, 1; 31st, 9.

Thunder-storms were reported in the several states and territories, by days, as follows: Ala., 3; Ariz., 9; Ark., 4; Colo., 2; Conn., 3; Dak., 4; Fla., 8; Ga., 3; Ill., 13; Ind., 5; Ind. T., 4; Iowa, 12; Kans., 10; Ky., 2; La., 9; Me., 1; Md., 4; Mass., 4; Mich., 8; Minn., 1; Miss., 2; Mo., 7; Mont., 1;

Nebr., 3; Nev., 1; N. H., 2; N. J., 4; N. Y., 5; N. C., 2; Ohio, 11; Oregon, 1; Pa., 7; S. C., 8; Tenn., 9; Tex., 11; Utah, 1; Vt., 1; Va., 5; Wash., 2; W. Va., 3; Wis., 8.

Thunder-storms were reported in the greatest number of states and territories (18) on the 1st. On the 2d, 6th, 16th to 19th, 26th, and 27th they were noted in from ten to fifteen. On the 13th and 29th no thunder-storms were reported, and on the 3d, 7th, 8th, 11th, 12th, 21st to 25th, 28th, and 30th they were reported in five or less states or territories.

They were reported on the greatest number of days (13) in Ill., with a total of 106 reporting stations. In Iowa (50 stations), Ohio (44 stations), Tex. (24 stations), and Kans. (40 stations) they were noted on from ten to thirteen days. In Cal., Del., D. C., Idaho, N. Mex., and R. I. no thunder-storms were reported, and in Ala., Ark., Colo., Conn., Dak., Ga., Ind., Ind. T., Ky., Me., Md., Mass., Minn., Miss., Mont., Nev., N. C., Oregon, Utah, Vt., Wash., and W. Va. they were noted on from one to five days.

### MISCELLANEOUS PHENOMENA.

#### DROUGHT.

Bismarck, Dak., 10th: The weather is very dry, and no rain has fallen since the 19th of last month.

Woonsocket, Dak., 31st: owing to the very dry weather plowing has been delayed to a greater extent than before during the last eight years.

Cedar Rapids, Iowa: the rainfall during the month has not been sufficient to keep the streams at their normal condition. Farmers in many places are complaining of lack of water in streams and wells.

#### FOREST AND PRAIRIE FIRES.

Jamestown, Dak., 4th: prairie fires were dangerously near Elbridge, ten miles west from here.

Bismarck, Dak., 9th: large prairie fires were observed several miles from this place; they were also observed to the south on the 29th and 30th.

Fort Totten, Dak., 9th: large prairie fires raged west of this place. A considerable amount of hay and grain and two farm houses were consumed. The fires moved southwest. Fires occurred on the 22d and spread rapidly over an area of seven miles northwest until they reached Devil's Lake.

Mandan, Dak., 11th: prairie fires, driven by a strong gale, threatened this town last night. The people turned out to fight the fire, and fire-breaks two hundred feet wide were made in all directions.

San Francisco, Cal., 24th: reports show that forest fires raged in Santa Cruz and San Joaquin counties, and that great damage was done to the fruit ranches and wheat.

Fort Sully, Dak., 28th: the whole western sky to an altitude of 30° was lighted up by prairie fires on the Sioux Indian reservation; prairie fires were also observed to the south and southwest of this station during the last four days of the month.

Fort Yates, Dak., 31st: one of the largest prairie fires ever known in this locality swept over the country opposite here, east of the Missouri River, in the evening. The town of Winona was only saved by the persevering efforts of its inhabitants.

Forest and prairie fires also occurred on the following dates: Fort Bidwell, Cal., 6th; Red Bluff, Cal., 14th, 24th; Fort Buford, Dak., 1st to 3d; Yankton, Dak., 30th; Fort Sill, Ind. T., 2d to 4th, 18th, 25th to 31st; Fort Assinaboine, Mont., 2d; Fort Elliott, Tex., 11th to 14th.

#### HALOS.

Solar halos were most frequently reported in Michigan and Tennessee, where they occurred on eight days. In Illinois, Oregon, and Pennsylvania they were noted on seven days, and in Maryland, New York, and Virginia on six days. No solar halos were reported in Connecticut, Delaware, District of Columbia, South Carolina, West Virginia, and Alabama, nor in

the Rocky Mountain regions, except in Nevada and Montana, where they were noted on one and two days, respectively. In California a solar halo was observed on one day. The days of their most frequent occurrence were the 11th and 21st, when they were reported in ten states and territories; on the 22d, in nine; and on the 10th, in eight. On the 2d, 6th, 13th, and 28th no solar halos were reported.

Lunar halos were most frequently reported in Illinois, where they occurred on fourteen dates, in Michigan on ten, in Kansas on nine, and in Tennessee on eight. No lunar halos were reported in Alabama, Connecticut, Delaware, District of Columbia, Louisiana, and Rhode Island. In the plateau regions of the Rocky Mountains they were noted on from one to six dates, and on the Pacific coast on from four to seven dates. In the central valleys west of the Mississippi they occurred on from three to nine dates. They were most frequently reported on the 15th, when they occurred in sixteen states and territories; on the 17th, in fifteen; on the 18th, in thirteen; and on the 16th, in twelve. On the 1st, 2d, 3d, 5th, 6th, 7th, and 28th no lunar halos were reported.

#### METEORS.

The distribution of meteors, by dates, over the country was as follows:

3d, Fort Sully, Dak., Pekin, Ill. 4th, Kalamazoo, Mich., Clayton and Egg Harbor City, N. J. 6th, Fort Sully, Dak., Cedar Keys, Fla., Cedar Springs, S. C. 7th, Egg Harbor City, N. J., Marion, Va. 8th, Charleston, Ill., Fox Creek, Mo. 16th, Culbertson, Nebr. 17th, Vevay, Ind. 20th, Palestine, Ill., Cedar Springs, S. C. 25th, Pontiac, Mich. 26th, New Westminster, B. C., Strafford, Vt. 27th, Duck, Ga., Kalamazoo, Mich., Riddleton, Tenn., Mesquite, Tex. 28th, Egg Harbor City, N. J., Cleburne, Tex. 29th, Duke, Fla., Kalamazoo, Mich. 30th, Egg Harbor City, N. J., Utica, N. Y. 31st, Duke, Fla., Wakefield, Kans., Tecumseh, Nebr., Egg Harbor City, N. J., Fox Creek, Mo.

The following are additional and more notable meteoric displays reported:

Vevay, Switzerland Co., Ind.: a large meteor was observed at 5.55 p. m., 17th, at about 40° above the eastern horizon, and moving eastward; it was separated in a brilliant train which was visible eight or ten seconds.

Duck, Union Co., Ga.: a very brilliant meteor was observed at 11.15 p. m., 30th; it started in the east at an altitude of 45°, and moved in a southwesterly direction. The meteor was followed by a luminous trail which lasted about five seconds. Several small meteors were also observed during night of 30th.

#### MIRAGE.

San Diego, Cal.: the Lakeside hotel, trees, and a small